

AMENDMENTS TO THE CLAIMS

In the Claims:

Please amend Claims 1-6, 8-13, 15, 16, 18, 24, and 26-28 and please cancel Claims 7, 17, 19-23, and 25 without prejudice. A complete copy of the claims including marked-up versions of each claim which is amended in this Amendment A appears below.

- 1 1. (Currently Amended) A laser multiplexing apparatus for laser produced plasma  
2 generation, comprising:  
3 a plurality of pulsed laser sources for generating a respective plurality of pulsed  
4 laser beams; and  
5 a ~~compound lens comprising at least two focusing elements~~ multiplexing element  
6 arranged to ~~focus at least two respective~~ temporally, spatially, and/or angularly interleave  
7 said plurality of pulsed laser beams to a focal point on cause them to propagate into a  
8 ~~common workpiece.~~ single, co-propagating output beam;  
9 wherein said plurality of pulsed laser beams and said multiplexing element are arranged  
10 and configured to allow the average power scaling up of said output beam to be  
11 controlled independently from the peak intensity of said output beam.

1 2. (Currently Amended) An ~~element~~ apparatus as defined in Claim 1, in which the  
2 ~~compound lens~~ multiplexing element comprises ~~an array of lenses; a rotating mirror or~~  
3 prism which introduces a time-varying angular deviation to the laser beams.

1 3. (Currently Amended) ~~A laser including an element~~ An apparatus as defined in  
2 Claim 1, in which the multiplexing element comprises a wedge-shaped prism that is  
3 rotated such that an output face of the wedge-shaped prism presents the same angle of  
4 incidence to the laser beams in turn as they are sequentially pulsed.

1 4. (Currently Amended) A method of multiplexing laser beams to generate a laser-  
2 produces plasma, comprising temporally interleaving at least two pulsed laser beams such  
3 that said beams ~~are multiplexed independent of their state of polarization;~~ propagate  
4 along a common output path.

1 5. (Currently Amended) A method as defined in Claim 4, in which at least two  
2 pulsed laser beams are spatially separated and in which a variable deviation element  
3 focuses the laser beams onto a common target area on a workpiece.

1 6. (Currently Amended) A method as defined in Claim 4, in which the variable  
2 deviation element is moveable so as to focus the temporally interleaved beams onto the  
3 common target area on a workpiece.

1 7. (Cancelled).

1 8. (Currently Amended) A method as defined in Claim 7, 4, further comprising  
2 temporally overlapping at least some of the pulses.

1 9. (Currently Amended) A laser multiplexing apparatus for laser produced plasma  
2 generation, comprising:  
3 at least two pulsed laser sources for generating pulsed laser beams; and  
4 a temporal ~~multiplexing~~ interleaving element arranged ~~to~~ for temporally ~~interleave~~  
5 ~~at least two~~ interleaving the pulsed laser beams to propagate along a common output  
6 path.

1 10. (Currently Amended) An apparatus as defined in Claim 9, in which the temporal  
2 ~~multiplexing~~ interleaving element comprises a variable deviation element.

1 11. (Original) An apparatus as defined in Claim 10, in which the variable deviation  
2 element comprises a moveable reflector or wedge.

1 12. (Original) An apparatus as defined in Claim 10, in which the variable deviation  
2 element comprises a moveable refractor.

1 13. (Currently Amended) ~~An~~ A laser multiplexing apparatus as defined in Claim 10,  
2 comprising:  
3 at least two pulsed laser sources for generating pulsed laser beams; and  
4 a temporal multiplexing element arranged to temporally interleave at least two  
5 pulsed laser beams, in which the temporal multiplexing element comprises a variable  
6 deviation element, and in which the variable deviation element comprises a moveable  
7 diffractive element.

1 14. (Original) An apparatus as defined in Claim 10, in which the variable deviation  
2 element has a number of reflective surfaces being an integer number of the number of  
3 laser sources being multiplexed.

1 15. (Currently Amended) An apparatus as defined in Claim 9, further comprising a  
2 laser multiplexing element ~~as defined in Claim 1,~~ comprising a compound lens having at  
3 least two focusing elements arranged to focus at least two respective laser beams to a  
4 focal point on a common workpiece.

1 16. (Currently Amended) ~~A high power laser produced plasma generation apparatus~~  
2 ~~comprising:~~ An apparatus as defined in Claim 15, in which the compound lens comprises  
3 an array of lenses.

4        a laser as ~~defined in Claim 1;~~ and

5        an ~~apparatus as defined in Claim 9.~~

17.    (Cancelled).

1    18.    (Currently Amended) A method of multiplexing laser beams for plasma

2    generation, comprising the steps of:

3        directing pulsed laser light beams from ~~two or more~~ a plurality of independent

4    lasers onto a movable deviation element to temporally, spatially, and/or angularly

5    interleaving said pulsed laser beams to cause them to propagate into a single,

6    co-propagating output beam; and

7        moving said deviation element at a rate such that deviation of a laser pulses from

8    said pulsed laser beams between lead and trailing edges is ~~minimized;~~ minimized;

9    wherein said pulsed laser light beams and said deviation element are arranged and

10   configured to allow the average power scaling up of said output beam to be controlled

11   independently from the peak intensity of said output beam.

19-23. (Cancelled).

24.    (Currently Amended) A laser multiplexing apparatus comprising:

a plurality of laser sources each of which generates a laser beam along an axis that is laterally and/or angularly spaced apart from the axes of all other laser beams; and

a temporal multiplexing element that is configured and arranged to temporally interleave the laser beams from the plurality of sources such that the plurality of laser beams all propagate close ~~together.~~ together;

wherein the temporal multiplexing element comprises:

an array of respective closely spaced, small lenses forming a "fly-eye"  
arrangement.

25. (Cancelled).

1 26. (Currently Amended) A laser multiplexing apparatus as defined in Claim ~~24,~~ 9,

2 wherein the temporal ~~multiplexing~~ interleaving element comprises:

3 a rotating mirror or prism which introduces a time-varying angular deviation to the  
4 laser beams.

1 27. (Currently Amended) A laser multiplexing apparatus as defined in Claim ~~24,~~ 9,

2 wherein the temporal ~~multiplexing~~ interleaving element comprises:

3 a wedge-shaped prism that is rotated such that an output face of the wedge-shaped  
4 prism presents the same angle of incidence to the laser beams in turn as they are  
5 sequentially pulsed.

1 28. (Currently Amended) A laser multiplexing apparatus ~~as defined in Claim 24,~~  
2 comprising:

3 a plurality of laser sources each of which generates a laser beam along an axis that  
4 is laterally and/or angularly spaced apart from the axes of all other laser beams; and  
5 a temporal multiplexing element that is configured and arranged to temporally  
6 interleave the laser beams from the plurality of sources such that the plurality of laser  
7 beams all propagate close together;

8 wherein the temporal multiplexing element comprises:

9 a plurality of beam shaping elements that have the plurality of laser beams  
10 respectively focused thereupon to cause them to produce a respective plurality of coaxial  
11 circular output beams; and

12 a common focusing element that produces a substantially collimated annular  
13 output beam from the circular annular output beams.